- $\vec{v}$ is a *linear combination* of $\vec{v}_1, ..., \vec{v}_n$ if $\vec{v} = c_1\vec{v}_1 + \cdots + c_n\vec{v}_n$, where the *weights* c_i are real.

- The *span* of $\vec{v}_1, ..., \vec{v}_n$ is the set of all linear combinations, over all possible weights. It is a linear space, which we can find by using a generic vector $\begin{bmatrix} b_1 \\ b_2 \\ \vdots \end{bmatrix} = c_1\vec{v}_1 + \cdots + c_n\vec{v}_n$

- $\vec{v}_1, \vec{v}_2, ..., \vec{v}_n$ are *linearly independent* (l.i.) when $c_1\vec{v}_1 + c_2\vec{v}_2 + ... + c_n\vec{v}_n = \vec{0}$ has only the trivial solution $\begin{bmatrix} c_1 \\ c_2 \\ \vdots \end{bmatrix} = \begin{bmatrix} 0 \\ 0 \\ \vdots \end{bmatrix}$ for the weights.

- If A has $\vec{v}_i$ as its columns, i.e. $A = [\vec{v}_1 ... \vec{v}_n]$, then
  span: linear space given by the $\vec{b}$s consistent in $A\vec{x} = \vec{b}$
  l.i.: $A\vec{x} = \vec{0}$ has only the $\vec{x} = \vec{0}$ solution (trivial solution)